Large Size – Alloys
LS-800 Series – The General Purpose Workhorse for Water and Oils

- Stainless Steel or Brass Mountings
- 1 to 6 Actuation Levels
- Lengths to over 11 feet (3.4 m)
- CSA Listed

Rugged construction and multiple options provide the LS-800 Series with exceptional versatility. Longer and more substantial than other metallic models, the LS-800 is capable of supporting larger, more buoyant floats, and is physically stronger for better reliability in contaminated or turbulent media. This series offers SPST or SPDT switches, and a choice of mountings, floats and materials that can be configured for a wide range of applications in water, oils, chemicals and corrosive liquids.

Temperature Sensing
To save space and simplify wiring, GEMS can incorporate a temperature sensor in the end of the float stem on any model type LS-800. Two sensor types are available: Transducers for continuous output, and Thermostats for switch actuation. See Page B-25 for details.

Adjustable Mounting
Allows stem to travel up and down for fine tuning your actuation points. See next page.

LS-800 switches are U.L. Approved for Class I, Division 2, Groups B, C, D hazardous locations
They are also available with FM-approved, explosion-proof junction box for Class I, Division 1, Group D hazardous locations (Type 1 mounting excluded). Units must be specified with stainless steel floats and be assembled completely at GEMS.

1. Mounting Types
Each mounting type can be configured with stem lengths (L_o) and float material indicated in the table below. Mountings are also continued on following page.

<table>
<thead>
<tr>
<th>Type 1</th>
<th>Type 8</th>
<th>Type 2</th>
<th>Type 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2˝ NPT†</td>
<td>1˝ NPT†</td>
<td>1-1/4˝ NPT</td>
<td>2˝ NPT</td>
</tr>
</tbody>
</table>

Note: Sanitary flange mountings are also available, but not shown. Please contact factory.

Type 1 and Type 8 mountings not FM approved.

Stem & Mounting Material
Brass or 316 Stainless Steel
Flange: Carbon Steel or 316 S.S.
Stem: 316 S.S.

Max Length (L_o)
36˝ (91.4 cm)
60˝ (152.4 cm)
140˝ (355.6 cm)

Mounting Position
Vertical ± 30° Inclination

Float Stops*
Brass Units: Beryllium Copper Grip Rings; Stainless Steel Units: S.S. ARMCO PH-15-7MO Grip Rings

* Units greater than 72˝ overall length are supplied with collars with setscrews (made of same material as stem and mounting) in place of float-stop rings. Collars are optional on units less than 72˝ overall length. Units requiring 316 SS float stops must be special ordered with 316 SS collars instead of grip rings. In some instances, concentration of chlorine and other corrosive compounds in the media require the use of collar type float stops. Consult factory for details.

† Type 1 and Type 8 mountings not FM approved.
**LS-800 Series – Continued**

**1. Mounting Types – continued**

Type 5 External Mounting units are ideal for tanks with limited access to tops or bottoms.

**Type 5 External Mount, Multi-Station**

- 2-1/4"-12 UNF MTG. 1/4"-20 THD. REF.
- 1/2" NHPT
- 2-5/8 (66.7) DIA. REF.
- 1-3/4 (44.5) 3/4" NPT
- PIPE, 2-1/2" PS 50 (40)
- 2-3/8 (60.33)
- 82-7/8 (73.03)
- 3" NPT PORTS (2X)
- 2 MIN. (50.8)
- MAX. L0 = 120" MIN. L0 = 4-1/2"

**Size 2**

**Housing Material** | **Brass** | **316 Stainless Steel**
---|---|---
**Stem and Mounting** | **Brass** | **316 Stainless Steel**
**Port Sizes** | **3/4" NPT** | **3/4" NPT**
**Max. Length (Lo)** | **120" (305 cm)** | **120" (305 cm)**

**Floats**

- **Compatible Mounting Types**
  - 1, 2, 3, 4, 8
- **Buna N**
  - 1, 3, 4, 5
- **316 Stainless Steel**
  - 1, 3, 4, 5 (Units >72")

**Float Types**

- A single float type is selected for use at all actuation points. Be sure, by reviewing the table below, that the desired float is compatible with the Mounting Type selected in Step 1.

**Float Material** | **Buna N** | **316 Stainless Steel**
---|---|---
**Compatible Mounting Types**
1, 2, 3, 4, 8 | 1, 3, 4, 5 | 1, 3, 4
Buna N | 316 Stainless Steel | 316 Stainless Steel
**Float Dimensions**
1-1/16" (27 mm) | 1-1/16" (27 mm) | 1-1/16" (27 mm)
1-3/4" (44.5 mm) | 1-3/4" (44.5 mm) | 1-3/4" (44.5 mm)
1-7/8" (47.6 mm) | 1-7/8" (47.6 mm) | 1-7/8" (47.6 mm)
1-13/16" (46.0 mm) | 1-13/16" (46.0 mm) | 1-13/16" (46.0 mm)
1-5/16" (33.3 mm) | 1-5/16" (33.3 mm) | 1-5/16" (33.3 mm)
1-1/16" (27 mm) | 1-1/16" (27 mm) | 1-1/16" (27 mm)

**Part Number**

- **253644** | **26032** | **10558** | **24864** | **14569** | **15666** | **138935**

**Operating Temperature**

- Water: to 180°F (82°C)
  - Oil: -40°F to +300°F (-40°C to +110°C)
  - -40°F to +300°F (-40°C to +149°C)

**Min. Media Specific Gravity**

- 0.55
  - 0.75
  - 0.55
  - 0.55
  - 0.75
  - 0.75
  - 0.80

**Pressure Ratings Chart (PSI, Max.)**

**Mounting Type**

- **1, 2, 3**
  - 150
  - 750
  - 300
  - 180
- **4**
  - 150
- **5**
  - **Brass**
  - 100 @ 70°F (21°C)
  - 150
  - 750
  - 300
  - 120

**Intrinsically-Safe Relays**

Using Gems SAFE-PAK® relays and barriers, these switches provide automatic refill/pumpdown and are intrinsically-safe without explosion-proof housing and piping.

See Section L

3. Electrical Specifications

Switch (N.O. or N.C.):
- SPST: 20 VA or 100 VA
- SPDT: 20 VA

Lead Wires: #18 AWG, 24” L., Polymeric (except as noted in Wiring Color Code chart at right).

Approvals: LS-800 Series switches are U.L. Recognized – File No. E45168; CSA Listed – File No. 30200

Typical Wiring Diagrams
For clarity, only two actuation levels are shown in each group diagram.

4. Actuation Level Dimensions

Switch actuation levels are determined following the guidelines below.

All units 72” or less $L_0$ with Stainless Steel or Buna N floats. Also any unit over 72” $L_0$ with Buna N floats:
- $A = 1-1/2” (38.1 mm) minimum distance to highest level (2”, Type 5 only).
- $B = 2” (50.8 mm) minimum distance from end of unit to lowest level.
- $C = 3” (76.2 mm) minimum distance between levels.
- $D = 1/4” (6.3 mm) minimum distance between actuation levels (Note: One float for two levels can be used only when low level is N.C. dry and high level is N.O. dry).

Types 1, 3, 4, and 5 units with stainless steel float. Part Number 15666:
- $A = 1-5/8” (41.3 mm) minimum distance to highest level (2”, Type 5 only).
- $B = 2-1/2” (63.5 mm) minimum distance from end of unit to lowest level.
- $C = 4” (101.6 mm) minimum distance between levels.
- $D = 1/4” (6.3 mm) minimum distance between actuation levels (Note: One float for two levels can be used only when low level is N.C. dry and high level is N.O. dry).

Notes:
1. A, B and C dimensions based on a liquid specific gravity of 1.0.
2. One float for two levels can be used only when 20VA switch is used.
3. Actuation levels are calibrated on descending fluid level, with water as the calibrating fluid, unless otherwise specified.
4. Tolerance on actuation levels is ±1/8” (3.2 mm).
5. TH (Temperature option) makes “B” dimension a minimum of 2.75” (69.8 mm).
Optional Integrated Temperature Sensors

- Compatible with LS-700 and LS-800 Series Units
- Thermostat Switches or Thermistor Versions

Advantages of integrated temperature sensors:

- Space Saving.
- Fewer intrusions into the tank.
- Electrical wiring emanates from a single source – eliminate multiple conduits.
- Economical – typically less expensive than separate sensors.

Look for units in this catalog with the temperature sensor icon: 🔥

Thermistor for Continuous Indication – TM-800 and TM-700

- Excellent repeatability.

**Value:** 10,000 ohms @ 77°F (25°C)

**Tolerance:** ±0.2°C from 32°F to 158°F (0°C to 70°C)

**Operating Temperature:** 302°F (150°C), Max.

**Alpha @ 25°C:** -4.39%/°C

**Dissipation Constant:** 1mW/°C in Still Air;
8mW/°C in Oil Bath.

**How to Order**

Temperature thermistors are available on LS-700 Series units with up to three actuation levels, and on LS-800 Series units with up to five actuation levels. To have thermistor added, order model TM-800 or TM-700.

Note: This option is not CE Approved.

Thermostat for Switch Actuation

- Standard Settings from 100°F to 200°F.
- Open or close switch on increasing temperature.

Use these switches to set off High/Low temperature alarms. Or, combine with GEMS relays to control tank heating and cooling, motor-operated valves, etc.

To designate the thermostat switch option, order model TH-700 or TH-800. Also specify the choice from selections A, B and C below.

A. Switch Rating:
   - For LS-800 Series: 6A/120V, 4A/240V, 100VA (non-inductive).
   - For LS-700 Series: 2.6A/120V (inductive).

B. Contact Operation on Increasing Temperature:
   - “Opens” when Set Point reached or “Closes” when Set Point reached.

C. Standard Temperature Set Point (±7.2°F; ±4°C):
   - 100°F (37.7°C), 125°F (51.6°C), 150°F (65.6°C), 175°F (79.4°C), 200°F (93.3°C)

Note:
1. Other temperature settings and tolerances available; 25 piece minimum order quantity applies.
2. Please call GEMS Sensors Inc. for more information.
3. This option is not CE Approved.
LS-800 Types Custom Length Float Type Level Switches

Application Environmental Conditions

This information is essential to the accurate and proper operation of your GEMS configurable sensor. Please complete fully and accurately before ordering.

1. Liquid Media: ____________________________________________
2. Pressure: Minimum ______ psig Maximum ______ psig
   Minimum ______ bar Maximum ______ bar
3. Temperature: Minimum ______ °F Maximum ______ °F
   Minimum ______ °C Maximum ______ °C
4. Specific Gravity: Minimum ______ Maximum ______

1. Series (Page No.):
   LS-800PVC (B-18)   LSP-800 (B-20)   LS-800 (B-22)
   LS-800-Adjustable (B-23)
   TM-800 (B-25. Thermistor Equipped)
   TH-800 (B-25. Thermostat Equipped)

See product page number for available mounting type and materials.

2. Mounting Type:
   Type A   Type B   Type C
   Type 1   Type 2   Type 3
   Type 4   Type 5   Type 8

3. Mounting and Stem Material (if choice available):
   Brass   Polypropylene
   PVC     PVDF
   316 Stainless Steel   Carbon Steel (Flanges Only, in association with stainless steel stems.)

4. Mounting Position:
   Tank Top   Tank Bottom

5. Float Part Number: __________________
   Matching floats will be used at each actuation level specified.

6. Switch Type and Rating:
   A. Group I   Group II
      Group III*   Group IV*
   B. SPST
   C. 20 VA   100 VA (SPST only)
      Please indicate if using microprocessor/PLC load: □ Yes □ No
* Not Available on the TM-800 Series.

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form. 800-378-1600

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form. 800-378-1600

7. Switch Actuation Level

   A. Actuation Level  Distance to Actuation Level (Inches)²  SPST Switch Operation² (Check Type)
      L6               N.O.  N.C.
      L5               
      L4               
      L3               
      L2               
      L1³              

   Notes:
   1. Measured from inner surface of mounting plug or flange.
   2. Switch position is “normal” with unit dry (tank empty).
   3. L1 is the distance to the lowest actuation level with mounting “up,” and is the distance to the highest actuation level with mounting “down.”
   4. Float stops are standard; see B-24 for specifications.

   B. Length Overall (L₀) ______________ inches (customer supplied support bracket assembly recommended for lengths over 72˝.)

8. Lead Wire Length:
   12”  24”  Other:__________________ inches.

Options:

   Temperature Switch Settings (°F):  100  125  150
   175  200

   On rising temperature, switch... Opens Closes
   Slosh Shield 316 SS (316 SS units only)
   316 Stainless Steel (Flanges Only, in association with stainless steel stems.)
   Brass (Brass units only)

   J-Box Electrical Connection:
   Explosion Proof Type (FM/CSA)*
   NEMA 4 Type
   Plastic ABS Type
* Requires stainless steel floats

Please contact GEMS Sensors Inc. for any configuration or special requirements not covered on this form. 800-378-1600